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ADULT LEARNING OUTCOMES BASED ON
COURSE DELIVERY METHODOLOGY

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Instructional Technology

by
Timothy Edward Jenkins


March 2005

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9-Feb-05

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ABSTRACT

Online learning or Computer-based instruction (CBI) requires students to set their own goals and online courses need to be structured so those goals are obtainable by most students. This study investigated some of the learning process outcomes in face-to-face classes in order to determine if there was a difference in academic outcome. Contrasts and comparisons were made between students taking both online and traditional courses during the same term. One hundred and five students that enrolled in one online and two on-campus courses during the same quarter were tracked. Survey and interview instruments were used that consisted of measuring academic performance and student satisfaction levels. Factors that were examined included student to instructor communication, student-to-student interaction, CBI course content selection and CBI course management. Sixty-four percent of the students did not pass the CBI course and expressed much dissatisfaction with the online learning process. This study identified key elements that hindered the successful delivery of the online courses. These elements include having brick-and-mortar classes running parallel to the online course classes and the

identification of specific course components and process improvements that will show results. These results include higher student satisfaction through better session attendance, higher academic achievement levels, and significant reduction in attrition of students taking online courses.

ACKNOWLEDGEMENTS

Many thanks to the staff and students of ITT Technical Institute - without their cooperation and support this study would not have been possible. I would like to acknowledge my mother for inspiring me to continue my education and strive to help others to reach their goals.

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CHAPTER ONE

BACKGROUND

Introduction

This study investigated some of the outcomes of the learning process of online and face-to-face classes in terms of attendance, grades, and student satisfaction. The study took place in a private post-secondary environment at a prominent national technical college. Online or CBI learning is being introduced for many courses and some of the reasons CBI learning is expanding so rapidly can be found in the efficient uses of technology. The low cost of entry (compared to other types of business costs, e.g., building a network), the low cost of materials (aided by software that assists the designer complete the tasks necessary to mount a course), and the low cost of transport (packets of data are not charged to the user by distance covered or time, as in a phone call) all contribute to the growth of online courses (Commonwealth of Learning, 2001).

The study took into consideration that most online courses consider the student to be an independent learner, which requires self-discipline and focus that a

dependent learner may not possess. However, this research attempted to find out what specific areas need to be addressed to make the online learning experience successful. Areas that were examined included student to instructor communication, student-to-student interaction, CBI course content selection and CBI course management. The design was a mixed mode study that included various quantitative data collection methods such as the analysis of student attendance, grades, and session times. The qualitative data consisted of interviews and surveys. The surveys targeted questions concerning whether academic outcome is measurably changed based on delivery mode. The data collected was triangulated and came from three separate sources. One source came from raw data such as student drop numbers and student academic advising reports or alerts. Another source of data came from online student surveys given three times during the quarter. The third source consisted of actual face-to-face interviews with students taking the online course under study. The study was done on one of seventy-five ITT Technical Institute Campuses. ITT is a private post-secondary school system with headquarters in Indianapolis, Indiana and campuses are geographically

dispersed throughout the United States (WWW.ITT-Tech.edu).

Statement of the Problem

The purpose of the study was to identify some areas that need attention to increase academic success in online coursework. Because academic performance and satisfaction are correlated this was one of the areas to be examined. What are some of those factors causing the online student to fail? The need to identify those factors is what drives this study. One area of concern is poor student attendance in online courses. For the purpose of this study login sessions and assignment submittal completion rates was measured as attendance. The typical online course may require the student to spend a minimum of five hours a week on the computer completing the assignments for that week (ITT, 2004). If the student cannot focus on the coursework and is not an independent learner then that student will have difficulty completing an online course.

Another area of education that has continually plagued instructors and academic administrators is that of persistence and dropout. Closely related to dropout

is attrition, which is the loss of student enrollment (from the institutional point of view). The foundations of risk in a learning environment have been explained for the most part by studies of persistence and dropout (Parker, 1999).

For this study then it is important to identify those areas that can contribute to higher retention levels, which will improve academic excellence, which will not happen unless high student satisfaction levels are achieved when a student is taking online courses. This study also helped to develop a needed confirmative evaluation technique to better understand how to gauge student satisfaction levels when taking online courses. The contribution of this study to the limited amount of data available made it a valuable research project. The unique opportunity of observing and monitoring student's progress made the data collection effort worthwhile.

Purpose of the Project

As identified in the statement of the problem, the purpose of this project is to reduce attrition and improve academic performance in online coursework. This study attempts to identify those areas that can be cost-

effectively modified to increase success for a variety of learner types. This study will add to the limited research available to online course developers. The findings may provide researchers with component recommendations that can add the needed dimension to the online learning environment. A body of knowledge concerning on-line learning is currently being assembled. The purpose of this study therefore is to make a contribution as education moves into the next phase of online delivery methods for convenience, cost-effectiveness, and to reach a larger and more diverse student body. The project identifies areas that online researchers and developers can benefit from by reading the findings and conclusions section of this study.

Research Questions

Questions asked by Osborn (2000a, 2000b), in terms of computer confidence, tutoring, computer skills background, study habits, and Web skills are relevant to the developing body of knowledge. Questions about age and GPA from Muse (2003) were considered in forming the basis of this research study. The intended contribution to this area includes the following question:

Does an adult student academic performance change based on class delivery mode?

Academic performance includes monitoring and measuring:

- Attendance records
- Weekly Grade reports
- Academic advising
- Failure reports and drops

Do the methods with which an online course is implemented and managed have a significant impact on student outcome?

Student outcome includes:

- High satisfaction levels with the course
- High achievement rates
- Better than average attendance and log-in sessions

Significance of the Project

The significance of the project was based on the accelerated needs of the educational community to increase the usage of online courses in both the public and private sectors. The school, which provided the researcher with the facilities to conduct this study, is in that mode. The significance therefore can effect student attrition, student academic performance, company

profits, and course accreditation. ITT Technical Institute is accredited by ACICS (American Council on Independent Colleges and Schools), which monitor student completion rates as one of the key areas to maintaining accreditation. When students drop from school financial aid must still be paid back. That can leave a student without a degree and a student loan to repay. Completion rates are also tracked by Wall Street analysts and can affect stock prices.

The Specific research question attempts to find out if an adult learner's ability or motivation to learn changes based on the delivery method or mode. What significant areas can be identified and shared to increase the successful implementation of online courses? What courses are better candidates to be implemented online versus a traditional classroom environment?

Limitations

During the development of the project, a number of limitations were noted. These limitations include the following areas:

- Student's backgrounds varied with no control in place except the entrance exam to the school
- Students were not separated by ethnicity or gender in the study
- English skills were not measured or factored as a reason students succeeded in the course
- Student's computer usage or skills were surveyed but not considered as a reason for success or failure in the online course.

Student's access to a computer was surveyed but not considered as a reason for success or failure in the online course.

- Student's prior enrollment in a Web-based class was noted during the interviews and was asked on the survey but not considered in the results.

Definition of Terms

The following terms are defined as they apply to the research paper.

2+1 Program - A course delivery format where a student at ITT Technical Institute takes 2 classes on-campus and 1 course online.

Academic Performance - A measurement of student performance based on attendance, grades, advising sessions, and repeat attempts of courses due to failures.

ADDIE Model - A model used by Instructional Designers that contains five phases which include analysis, design, development, implementation, and evaluation.

Application Performance - requiring the learner to use or apply the information.

ARCS Model - Propounded by John Keller in the 1970s, the ARCS model of educational ideology means Attention, Relevance, Confidence, and Satisfaction).

Assessment - The systematic collection of data pertaining to programs or people.

Cognitivism - The school of learning that believes adult learning is based on previous experiences and is not always predictable.

Compact Disk - High-quality music and other sound recording on a 4.75-inch disk that is read by a laser beam

Computer-based instruction (CBI) - Software program that displays information and instructions on a video screen, requiring learner objectives for the topic or task.

Confirmative evaluation - A continuous form of evaluation that comes after summative evaluation used to determine whether a course is still effective.

Curriculum - List of courses and content framework for a subject.

Distance education - Instruction in which the instructor and student are separated in physical location and time, requiring the instruction to be fully designed and developed prior to implementing the course.

E-Learning - Learning from instruction offered via Internet or intranet

Evaluation - The process of determining the capability of learners, the course, or the instructional method to achieve the instructional objectives set out at the beginning of the course.

Formative Evaluation Testing - a new instructional program with a sampling of learners during the

development phase, and using the results to improve the program front-end analysis.

Guided discovery - training approach in which learners are put into a simulated environment wherein they go through the course based on guidelines.

Instructional designer - Person responsible for carrying out and coordinating the systematic design process.

Instructional technology - Resources (machines and materials) used for instruction; process of systematic instructional planning

Learner Characteristics - Factors relating to personal and social traits of individuals and learner groups that need consideration during planning or learning.

Learning - A relatively permanent change in behavior that may or may not be the result of instruction

Multimedia - Computer program controlling display of verbal information along with still photographs, video, and audio sequences in various formats.

Needs assessment or analysis - Procedure of gathering information before deciding whether there is a substantive need for instruction or training.

Non-synchronized online communication - When instructor can only communicate with students using non-interactive techniques, (i.e. email, message board, etc).

Online Learning - A format of study where the student can access the course using a computer and the Internet 24 hours a day / 7 days a week.

Synchronized online communication - When instructor has the ability to communicate with students using interactive techniques, (i.e. live-chat, net meeting, etc).

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Several factors in this study pertain to identifying some of the key areas hindering the successful outcome of on-line courses. The importance of identifying and recommending these areas are important to ongoing research concerning the delivery of on-line courses. The rollout of new online courses is currently underway or in the planning stages at many public and private educational institutions. Unsuccessful academic outcomes due to poor on-line course construction or implementation issues can cost students additional tuition and can hurt school enrollments thereby reducing budgets and profits (Cuban, 2002).

Other researchers had previously found that bandwidth and features hindered online courses. For example, in 1997 the American Institutes for Research in Washington, DC concluded that the effectiveness of using technology for the delivery of education was based on the amount of bandwidth available to the user, and how well the course software features were understood and

utilized. (Berman, 1997). Currently, the problem of bandwidth and features has been solved with the advent of DSL and JavaScript technologies. Another area of interest concerning online courses is that of student satisfaction. A study conducted by Dr. B. Draude of Middle State University in Tennessee found that on-line students were harder to satisfy than classroom students taking the same course. In some cases he points out that an on-line instructor may spend two-three times more time preparing and conducting an on-line course versus a brick-and-mortar classroom (Draude, 1999). Finally, another study conducted by researchers at Ohio State University found that many schools attempting to implement on-line courses were simply porting the classroom curriculum over to an online format. The study went on to find that those courses had many student drops and what is really needed to make an on-line course successful is that the curriculum must be re-written for an online format (Ginsbairg, 1998).

In this study of online learning several areas were analyzed. Some of these areas included identifying system problems, instructional problems, and sequencing issues. Another area of investigation was to compare the

online learning experience with the traditional face-to-face classroom learning experience. Student satisfaction was another factor considered in the research. All of these factors had one commonality: The Students are all Adult Learners.

The Adult Learner

According to recent research, the adult learner can benefit from a technologically enhanced environment (Cahoon, 1998). The adult learner tends to possess characteristics that can make him or her a better-quality student (Butler, 1998). Adult learners possess distinctive needs that should be addressed adequately in an educational setting (Kimble, 1999). Primarily, adults have a propensity to be self-directing (Knowles, 1994). The mature student has a specific purpose for attending college and their academic objectives are clearly set (Yilirim, 1999). Typically adults have experienced life, established their priorities, and know precisely how to achieve their goals (Knowles, 1984). Secondly, adult possess life experiences that can serve as a positive learning resource (Knowles, 1984). Adults draw on their

past experiences as prior knowledge, which can positively contribute to their education (Brooks & Brooks, 1993).

Less mature students, regardless of their academic ability, do not possess these life experiences. This is why several online course providers will not allow a student to enroll unless that student has:

- 1) A current job
- 2) Is over 21 years of age

(Source: UOP, 2004)

Another important characteristic of adult learners is that adult students can relate to their peers without the student conflicts typically experienced by non-adult learners. The college population tends to provide a network of support for one another without the behavior issues experienced at lower levels of education (Knowles, 1984). Lastly, adult learners tend to value the economy of effort. Time management is a higher priority with most adults (Kimble, 1999). Researchers have stated that both technology and teaching-by-example (also known as "learning-by-example") are beneficial elements in determining the success of learners in higher education. (ETRD, 1994). Markwood and Johnstone (1994), for example, support the use of examples as a new pathway towards

educational development, and researchers have also called for the integration of technology. Further, the use of examples through the push for increasing technology in the college setting has also determined a shift in the way educational development is pursued. Clearly, the changing focus of the educational environment promotes the use of technology and variety of learning approaches in order to determine the greatest gains. These common adult learner characteristics outlined can contribute to adults' successful integration of technology. The reasons for this study were based on the fact that online courses should work well with adult students, but the results of this study points to areas that online courses have not yet addressed.

In an online course the educational experience can be greatly influenced by both the course designer and actual instructor (Vigilante, R. 1994). In the study of online courses it is apparent that there has been a fundamental change in the way education is delivered. For example, in the For-Profit distance learning industry the University of Phoenix (UOP) is currently the leading provider of online education with over 50,000 students currently enrolled with a growth rate of 25% per year

anticipated (United States Dept. of Education, 2004). This phenomenal growth rate does not however highlight the current student completion rates of the online programs, which stand at 46% for the UOP (USDE, 2004). This is a cause for concern. This concern merits a closer review of studies concerning student satisfaction.

Student Satisfaction

Within the vast literature on college student outcomes, the study of the ways that students evaluate their postsecondary education experiences holds a somewhat unique position. Although it has been observed that "it is difficult to argue that student satisfaction can be legitimately subordinated to any other educational outcome "given the investments that students make in attending college (Astin, 1993, p.273), studies focused specifically on student satisfaction are relatively scarce in the literature (Astin, 1977; Bean & Vesper, 1994; Bean & Bradley, 1986). At the institutional level, faculty and administrators grapple with student satisfaction issues on a daily basis yet have few research based-based resources to guide their actions as they strive to improve the

quality of their educational offerings (Dey & Hurtado, 1995).

Previous studies show that researchers have approached the study of student satisfaction from several different perspectives. In the 1970s, job satisfaction frameworks have been tested (Betz, Klingensmith, & Menne, 1970). Other researchers have investigated student satisfaction in connection with different outcomes (e.g., student performance, achievement, attrition, and retention), where student satisfaction is viewed as only one component of student's overall adjustment to the college environment (Aiken, 1982). Further, student satisfaction has been researched in relation to specific services, programs, and student populations (Bean & Vesper).

From the research Bean and Bradley (1986) attempted to identify factors that have the greatest effect on both satisfaction and performance. They proposed a seven factor scale expected to influence satisfaction: Institutional fit (feeling of belonging), academic integration (being interested, motivated, and confident as a student), utility (usefulness of one's education - personally and professionally), academic difficulty,

social life, memberships in campus organizations, and class level.

Pike (1191) used latent constructs (i.e., theoretical constructs for which measurements are not available) in his research model to investigate the performance-satisfaction relationship. His model included effects for background (gender, high school grades, and ability) on coursework (engineering and business courses), involvement (attending cultural events, faculty-student interaction, and peer interaction), and performance (grades); however effects for background on satisfaction were not included. Most of these studies found a positive relationship between student satisfaction and institutional fit, academic integration, utility, and social life; and a negative relationship between satisfaction and academic difficulty. Gender differences were found - for women, institutional fit was the best predictor of satisfaction, and for men, academic integration was most important. Women also were less satisfied with their college experience if they experienced academic difficulty.

Reflecting on the original research question concerning the adult learner and academic outcome based on

delivery method results in research concerning traditional instructional techniques and the Instructional Design process. This covers the areas that the online course should encompass to ensure the outcome is the same or better when an adult learner is taking an online course.

The Instructional Design Process

Government, industry, and academia underestimated the development and implementation of online courses. Saba (2000), describes government as trying to catch a running train instead of laying the rails for the train to proceed when he describes distant learning implementation by the United States Department of Education. Several of the key areas of concern with online courses include having a standardized transcript for online course work (Web-based Educational Commission, 2000). Those are regulatory issues and most certainly will be addressed as online courses mature.

However, the purpose of this study is to investigate those areas holding back the online course success and what areas need further refinement. One of those areas concerns the role of language in education.

"Miss Kelly said that when you talk to somebody it's like you're playing ball. First when somebody asks you a question, and that means they throw the ball to you. But you have to do more than just catch a question like you catch a ball. Here's the important part. You have to throw the ball back. When somebody asks how you are, you can't just say, 'Fine.' You say, 'Fine, thank you, and how are you?'" "What does this have to do with...?" "Everything," I said. "Miss Kelly said you have to throw the ball back. So I threw it back and we began the interaction"(Peck, 1974, p. 5). Vygotsky (1978) writes that "...adult learners solve practical tasks with the help of their speech, as well as their eyes and hands" (p. 26). In Vygotsky's view, speech is an extension of intelligence and thought, a way to interact with one's environment beyond physical limitations: ...the most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge (p. 24). This higher level of development enables adult learners to transcend the immediate, to test abstract actions before

they are employed. This permits them to consider the consequences of actions before performing them. But most of all, language serves as a means of social interaction between people, allowing "the basis of a new and superior form of activity in adult learners, distinguishing them from animals" (Vygotsky, 1978, p. 28).

Current literature also supports the notion that personal factors have an influence on the development of individual perceptions about "Web-based teaching" in the educational model (Crooks, 1977). In fact, Rutherford and Grana (1995) called for a change in the way faculty view specific technology-based educational tools, calling for changes in both the attitudes and practices related to technology, including the use of email and feedback mechanisms to keep the student on-track. Smith (1990) also stated that collaborative and interactive interaction with the course participants, are beneficial to the Web-based learning process.

The development of effective communication skills related to both taking and teaching a Web-based course and the use of technology are elements that have positive outcomes and should be approaches utilized for distant learning success (Rutherford and Grana, 1995). That is

one of the key points to this study, what is hindering the success of online learning? Is it motivation? The researcher then took a look at the Instructional Design process concerning motivation and the learning process.

The Attention, Relevance, Confidence, and Satisfaction Model

In the 1970s John Keller found himself in disagreement with the prevailing educational ideology. According to Keller, it was not ability so much as motivational strategies that inspired learners to go through and benefit from the learning experience (Keller, 1999). He propounded the ARCS (attention, relevance, confidence, satisfaction) model.

- According to Keller, the initial strategy of gaining attention should be to stimulate the interest and curiosity of learners
- Learners should next be shown the relevance of the learning process.
- Keller then says that the course should be structured so that the learner is allowed to develop confidence.

- Finally, Keller points out that the learner should be able to use the newly acquired knowledge.
- Keller points out the motivational aspects of learning with respect to ARCS model of learning. The online designer should utilize the ARCS model to ask certain questions and analyze the answers to them. These questions involve the value of the course to the learners, and the goals that they would like to achieve.

The online curriculum writers at ITT took advantage of the ARCS model, however when the course was implemented several challenges were identified which are outlined in the findings section of this paper. Utilizing PowerPoint and discussion boards appears to be the major thrust in the current version of the ITT Questa on-line course interface as observed by the researcher in this study. Another interesting variance to the ARCS model depicted in figure 1 below is the theory of the learning cycle, as proposed by Donna E. Walker (Walker, 2000).

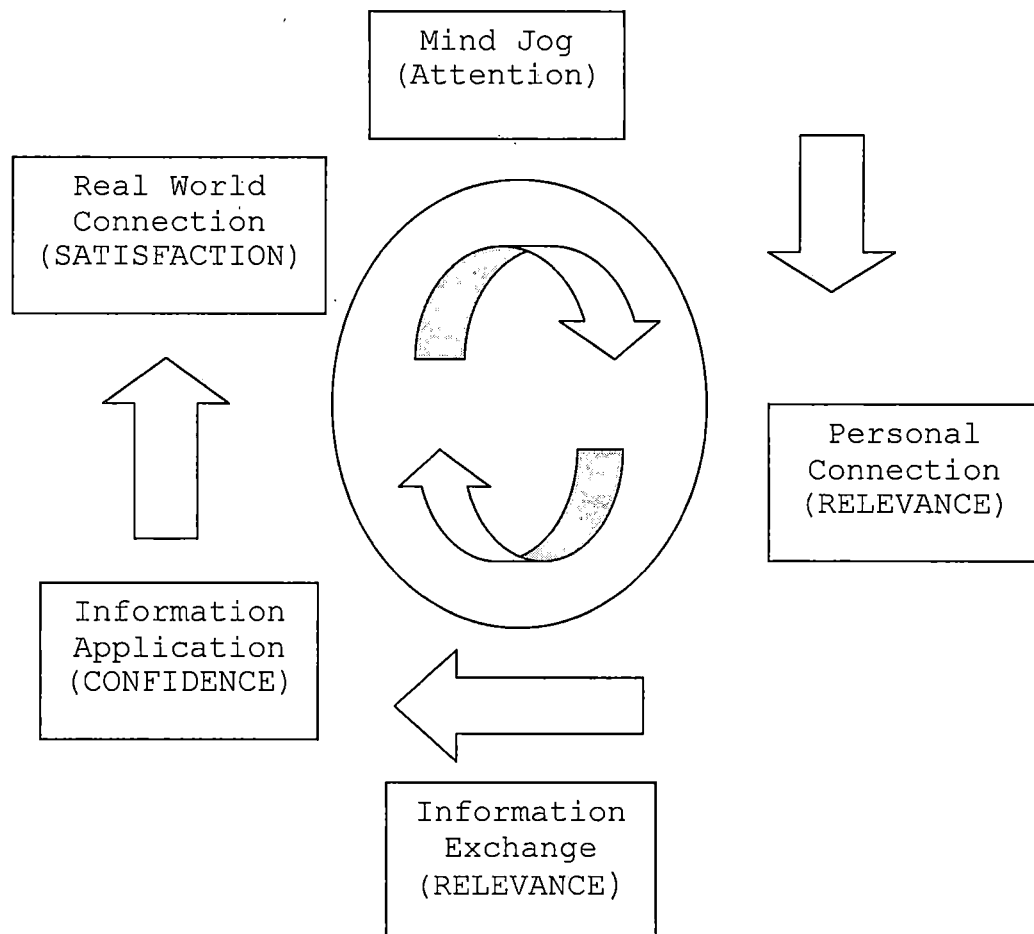


Figure 1. Learning Cycle

The learning cycle is important to online instructional designers because the student must acquire a desire to learn (Chanlin,1994). In his research Dr. Chanlin points out that web-based courses are not the same as classroom courses in content. In fact, online courses are more difficult to develop, implement, and administer than classroom courses. These are some of the key mistakes being made as the educational community moves to an online format. For example, the ITT curriculum for the online course called "Strategies for the Technical Professional" was not rewritten for an online format. The existing curriculum was utilized and delivered as if being taught in a traditional classroom. References to teams and weighted student interaction made it frustrating for student participants to complete the assignments successfully. Resolutions to these problems are outlined in the recommendations section of this study.

Instructional System Design or ISD is the methodology used for the systematic development of courses, which might be ILTs, CBTs, or WBTs. While there are several dozens of ID models, they are all based on the widely accepted ADDIE model. There are five phases

of the ADDIE model. These phases create a structured and effective flow that guides and controls course development. Online course developers need to pay close attention to the ADDIE model for a successful outcome (NIIT, 2003). The five phases of the ADDIE model include analysis, design, development, implementation, and evaluation. Table 1 summarizes these key phases in the form of questions.

Table 1. Phases of the Analysis, Design, Development, Implementation, and Evaluation Model

Phase	Question
Analysis	WHY am I teaching this course? WHO am I teaching it to?
Design	HOW am I going to teach it?
Development	WHAT exactly am I going to teach?
Implementation	HOW should I deliver the course?
Evaluation	HOW was the course?

Summary

The literature review discussed was aligned with the issues and comments made by several key industry and academic personalities that have made influences on the development and delivery of online courses. When an instructor is in front of the classroom there are so many elements that are not considered when developing an online course. The teach by example methodology cannot be underestimated and therefore must be compensated for when the instructor is no longer there physically as in the case of an online or CBI course.

Developers of online courses have much to learn and to improve the online courses to match the classroom delivery format. The chalk-and-talk classroom curriculum cannot just be ported over to an online course curriculum. The evidence of online course failures are relevant to this study undertaken at ITT Technical Institute, known for quality technical education and better than average completion rates. Market conditions are driving the online course implementation and therefore a new approach to course development must be pursued in order to maintain the same educational quality

and learner outcomes as pointed out in the literature review section of this study.

CHAPTER THREE

METHODOLOGY

Introduction

The purpose for this study is to investigate factors related to the outcomes of the learning process based on how the course is delivered, either online or in a classroom. Factors related to this study included tracking attendance, student weekly grade reports, and student satisfaction levels while taking the on-line course. The researcher made use of the opportunity to conduct this research on live participants that have signed up for a two-year post secondary degree at ITT Technical Institute. ITT Educational Services, Inc. (ITT/ESI) is a provider of technology-oriented postsecondary degree programs in the United States and is traded on the NYSE with the stock symbol of ESI (WWW.ITTESI.COM) .

Factors of particular concern were the grades of the on-line students. More than 50% of the on-line students averaged a grade of D or below (grade of 60% or below in the TB133 Strategies course) during most of the quarter. Those failing students were tracked to see what efforts

were being made from the student to pass the on-line course. The students were called out of their on-campus courses and interviewed about the online course and what difficulties they were having. The student was then asked to login to the Questa system and together the researcher and student would analyze the course status and grade report.

Another important factor that was measured through the use of surveys and interviews was that of student's attitudes concerning the on-line course experience. Of course perceptions that the new students had about taking an online course were considered and the researcher saw attitudes change from a positive to a negative during the quarter. The question of this research paper asks if an adult's student academic performance changes based on class delivery mode? That mode is either online or in a chalk-and-talk classroom. The data collection effort focused around the student's perspective of the online learning process and compared it to the on-campus courses. For the purpose of this study academic performance includes monitoring and measuring: Attendance records, Weekly Grade reports, Academic advising, and Failure reports and drops.

Do the methods with which an online course is implemented and managed have a significant impact on student outcome?

Student outcome includes:

- High satisfaction levels with the course
- High achievement rates
- Better than average attendance and log-in sessions

A very significant portion of this study includes the documentation and recommendations of online student participants to greatly improve the online delivery format. The researcher synthesized the key research areas to assist online designers and implementers in development. The design is a mixed-mode study that includes various data collection methods such as analyzing student's academic performance reports and through the use of interviews and surveys. The surveys targeted questions concerning whether academic outcome is measurably changed based on delivery mode.

The quantitative data collection procedures were based on student academic performance numbers. First, data was collected and analyzed from students that took the same courses in previous quarters, but all three

classes were held on campus before the online courses were developed and rolled-out. The data collection effort was undertaken during spring and summer quarters of 2004. The student participants were those that enrolled with new into the 2+1 program. Two of their courses were held on campus and one was done online. In the spring quarter, the course selected to be online was called TB133 Strategies of the Technical Professional. In the summer quarter, the course selected to be online was called GE127 College Math I. These two courses are not related and have unique course components that created unique opportunities for data analysis and recommendations outlined in section five of this study.

Population Sampled

The data collection effort was undertaken during spring and summer of 2004 with new students coming into the 2+1 program. Two of their courses will be on campus and one will be online. One-on-one interviews, surveys, and analysis of student attendance and performance records were undertaken. ITT uses a Cohort scheme indicating when they had enrolled grouped students. An example of how a cohort is coded would be 124ITCE;

indicating this group of students enrolled in the 12th week of the year 2004 into the Information Technologies evening program.

In this research design, single stage cluster sampling methodology was used. The purpose of cluster sampling is to sample economically while retaining the characteristics of a probability sample. Since the primary sampling unit (PSU) is a cluster of elements located in proximity to one another as opposed to the PSU being the individual element in the population, cluster sampling offers a time and cost efficient way to sample a population that is spread across a large geographic area (<http://www.musc.edu>).

The way single stage cluster sampling works is that sampling is done only at one of the groups that can represent the whole. For example, the cluster sample might be city blocks. In single stage cluster sampling, all of the apartments in all of the houses on the city blocks would be included in the study after the cluster sample of city blocks is selected. This design worked well for this study since all of the ITT schools offer the same curriculum for each of the 75 campuses geographically dispersed throughout the U.S.

The target population consisted of all 75 ITT Technical Institute campuses in the continental United States that offer both associate and bachelor degrees in Information Technologies (IT), Computer-Aided Design and Drafting (CDD), and Computer Electronics Engineering Technologies (CEET). ITT Technical Institute is a post-secondary private educational institute that began in 1968 as a training school for electronics technicians. ITT was owned originally by ITT Industries (International Telephone and Telegraph) and then in 1998 it was spun-off as ESI still keeping the ITT name. Today, it is a publicly traded fortune 500 company under the symbol ESI. In 1998, ITT implemented the Information Technologies curriculum.

Traditionally, all courses were held on campus three days a week for five hours a day. The educational delivery format has evolved now into a three-course format with one of those courses being online. This study can be instrumental in identifying components that can make a difference in the success of this venture. This research project was conducted on one of the selected ITT campuses located in San Bernardino, California.

The San Bernardino campus has a diverse student body and is one of the largest campuses in the ITT system with over 900 students currently enrolled, which made up the projects accessible population sampling criteria. The student's age range can vary between 18 and 50 years old with an average between 21 and 35. Most of the students are computer literate and all have passed the Wonderlic entrance exam before starting the program. The Wonderlic exam is given to all students attempting to enroll at ITT Technical Institute (WWW.Wonderlic.Com). The exam measures aptitude of basic reading, math, and comprehension skills.

Students have either registered for Associate of Science Degrees in Computer-Aided Drafting and Design (CDD), Computer Network Systems (CNS), Software Applications and Programming (SAP), or Computer Electronics and Engineering Technologies (CEET). All of the programs share the same courses in the first quarter. The actual sample will comprise of those students in the first quarter enrolled in the 2+1 online program. Students also attended a two-week online orientation program to familiarize them with how to be an online

learner. Figure 2 shows the breakdown of the student sampling criteria.

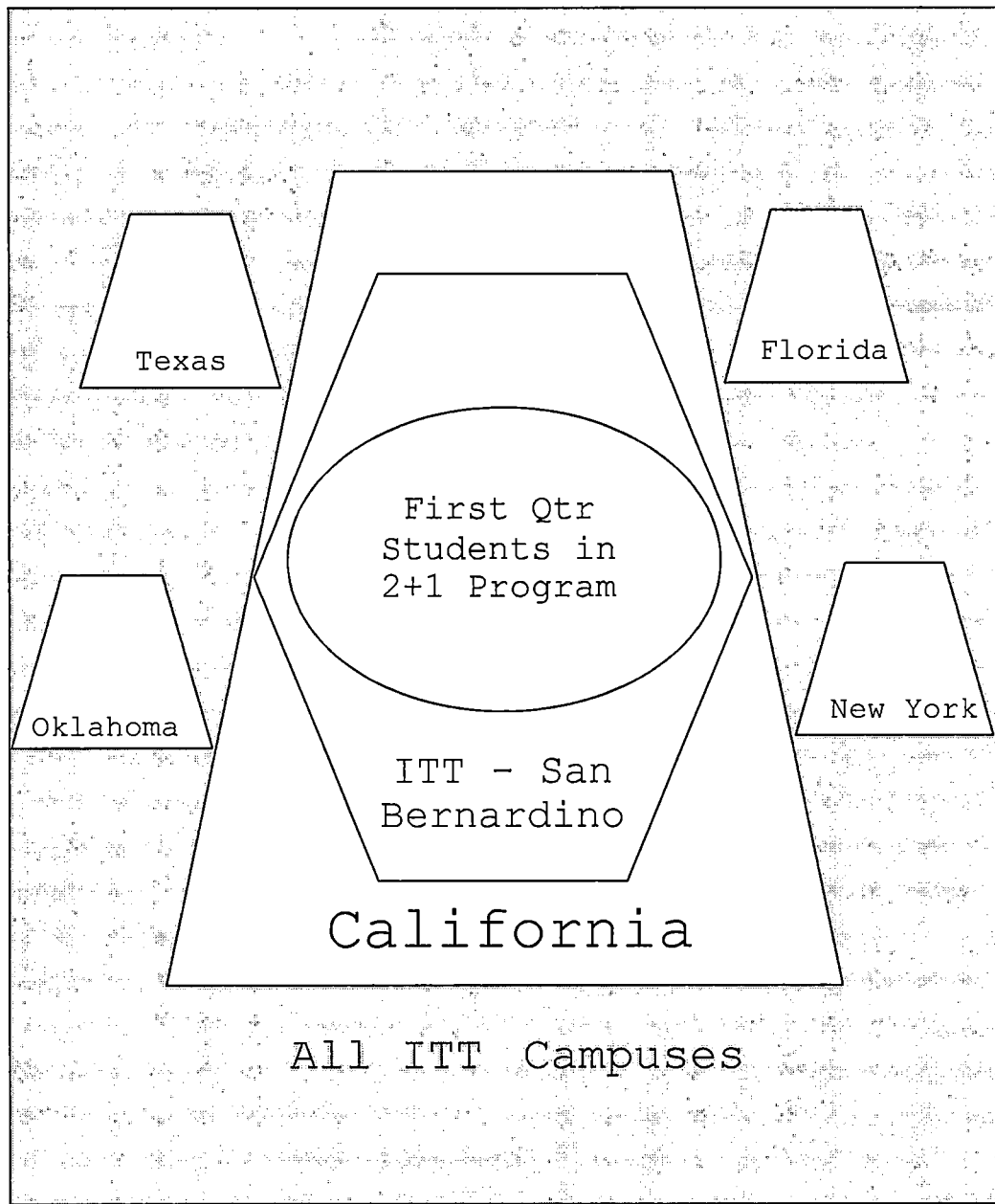


Figure 2. Student Sample

The 2+1 format is a new program rolled out in March 2004 which positions one of the three required courses in an online format. Students were accessible for the other two courses, which were held on campus. The 2+1 students were surveyed and interviewed and that data was compared to the group of students that have already attended the same courses but without being online from previous quarters.

Data Collection

The main data collection effort was launched in March of 2004. The 2+1 students were asked to complete the first survey during the first week of the quarter. Student satisfaction information was analyzed against the previous student surveys and interviews. Comparisons were drawn and charted as described by Fraenkael and Wallen (2000). Three instruments were used to collect data in this study. A questionnaire of semi structured retrospective questions designed along guidelines of qualitative research described by Fraenkel and Wallen (2000) was deployed. The researcher also added questions from another instrument that tested computer and online skills (Kronheim, Pugh, & Spear, 2001). Appendix A

details the main instrument used to gather the online student participant data.

The instruments then consisted of a survey given to the students four times during the duration of the quarter, which meets for 11 weeks. Interviews were conducted of students that drop the course and of those that are excelling in the coursework. Data was collected concerning academic progress, attendance (online course versus on-campus course), and interviews were conducted of the instructors of both the online and on campus courses. The questions to the instructors will range from student interaction experience of the current students and what is the instructor doing to motivate the students?

Ensuring the validity of the data was of primary concern. It was important in this study to utilize an instrument that could produce reliable results of the data collected. Since the criterion variable of this study (successful completion of the Web-based class) was dichotomous, the researcher tested predictive validity using a two-group discriminate analysis function by Moss and Triggs (2002). Many researchers have executed this procedure while attempting to discover patterns of

persistence (Garrison, 1985; Powell et al., 1990; Pugliese, 1994).

Several reporting mechanisms were utilized from the online course software known as Questa. Questa was custom developed by ITT (ITT Directive 2-1 Online, 2004) and provides the main interface for the online student. Questa has several reporting features that include:

- Student Last Date Logged into the online course
- Student never logging into the online course
- Student grade reports sorted by failure
- Student grad reports sorted by best performance
- Ability to reset the students password on the fly

System allows the online instructor to send the Dean of each campus 'Academic Alerts' for those students that require physical interaction.

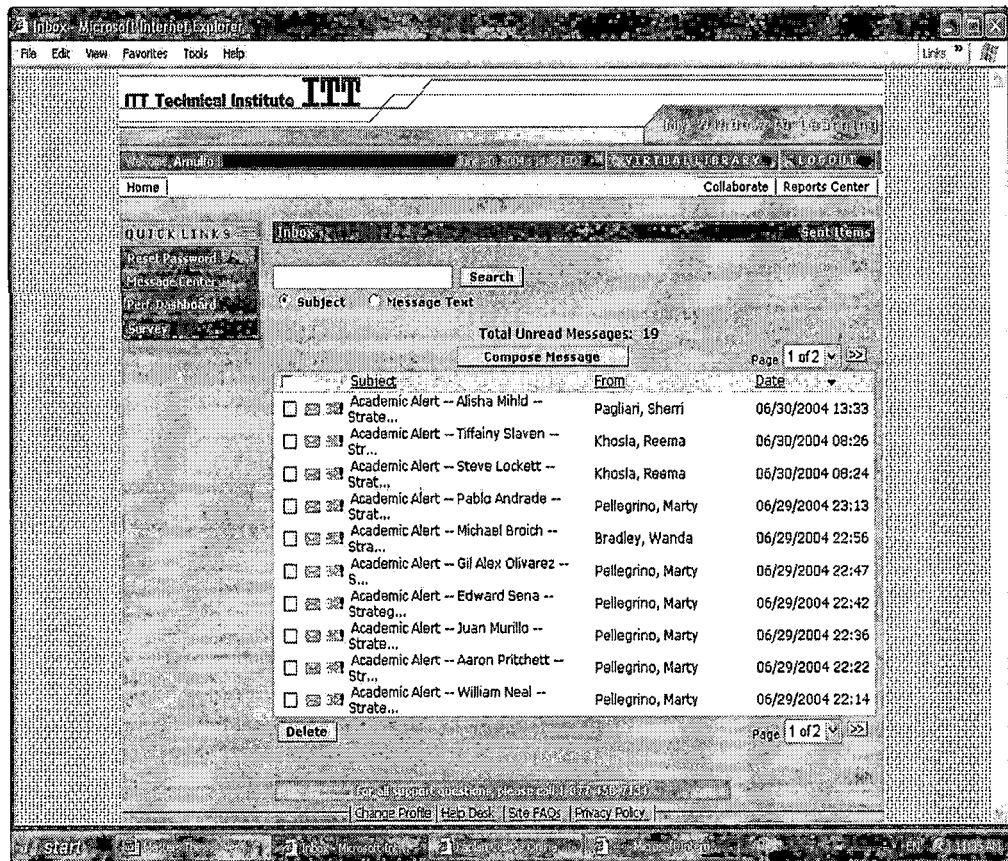


Figure 3. Academic Alerts in Questa

Finally, several observations were conducted of the classes while they are taking the other two on-campus courses. Student's interaction with peer students was noted while students having online course difficulties were categorized separately to determine traits associated with the classroom environment. It was also expected that students having success in the online course were also having difficulty with the on-campus courses and those will be categorized as required. The interviews conducted were coded and categorized into usable data for analysis explained in the next section of this paper.

The researcher used several techniques to ensure the trustworthiness of this qualitative study. One technique was a checklist for the observations and interviews so the data collected were consistent and non-biased. Creating a checklist can assist in ensuring questions and observations are collected and documented correctly (Clagett, 1996). Member checks, as mentioned earlier were used to ensure correct meaning of the interviews that the data was transcribed correctly.

Data Analysis

The data collection processes occurred over the course of 3 months between March of 2004 - June of 2004. The data collection process continued until enough subjects were evaluated to provide a solid subject population for the study. A total of one hundred and five subjects participated to provide a substantial base for the assertions and to increase the applicability of the findings. The data collected was of the mixed mode. Member checks were given to the student and teacher participants of the one-on-one interviews. Feedback from those member checks was incorporated into the data analysis methodology.

The qualitative questions gathered from the surveys and the interviews were categorized and grouped into a descriptive summary of findings. The most important data was that of attendance or participation in the online course. The decision to make attendance as the most important criteria was based on the analysis of the ITT attendance policy. This policy states that a student "will be automatically terminated from the online course if no logon activity (attendance) is registered for 17 calendar days" (ITT/ESI, 2004).

Student satisfaction feedback comprised the third most important data collection element. Using the Questa system attendance and academic reports enabled the researcher to call the students out of their normal on campus courses to perform interviews. These were effective to determine what issues the students were having in achieving academic success with the online course. Daily reports were printed and students were advised to improve their grades and given due dates to get the assignments completed in the online course. Figure 4 and Table illustrate the attendance tracking tools utilized.

Online Course Attendance Report - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites Media Print

ITT Technical Institute **ITT**

My Window to Learning

Home Announcements Virtual Library Collaborate Reports Center

QUICK LINKS

- Reset Password
- Message Center
- Perf. Dashboard
- Survey

Online Course Attendance Report

Section Status: ☒ Active ☐ Inactive

School:

Days Absent: or more days *

☒ Active Students ☐ Inactive Students

Note: The list includes students who are absent for more than the number of days specified.

For all support questions, please call 1-877-156-7100

[Change Profile](#) | [Help Desk](#) | [Site FAQs](#) | [Privacy Policy](#)

Figure 4. Attendance Tracking Request

Table 2. Attendance Tracking Data Collection

	<u>O1</u>	<u>T1</u>	<u>T2</u>	<u>P1</u>
Student A	A	P	P	1/3
Student B	P	A	P	1/3
Student C	P	P	P	0/3
Student D	P	P	A	1/3

Where O1 = Online course T1/T2 = On campus courses
 Where P1 = Ratio of absence of all 3 courses
 Where A = Absence and P = Present

The ratio of online attendance to on-campus attendance was tracked to eliminate those students not attending either format. Grades were accessed and analyzed as depicted in Figure 5 and from Table 2. Students that were failing received advising by the department chair. Interviews were conducted of those students to identify important online issues that were contributing to the failing grades. Students Grade Point Averages (GPA) were analyzed to eliminate those students having low grades regardless of the delivery format. Students that showed high GPA's but were failing the online course were of particular interest to the researcher and additional interview time was spent with them.

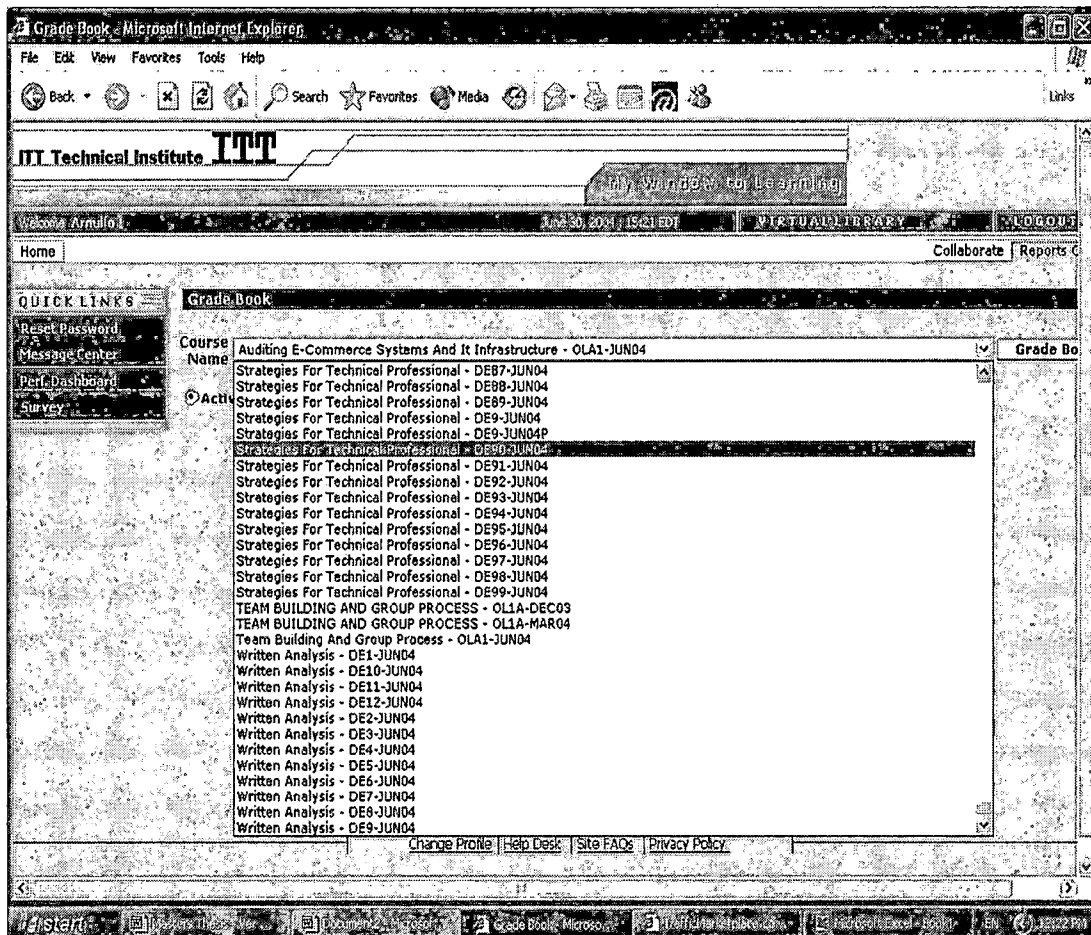


Figure 5. Selecting Course for Grade Analysis

Table 3. Compiling Weekly Grade Reports

Grades Week 1

Student	Online	On Campus 1	On Campus 2
0001	F	C	B
0002	D	B	A
0003	B	C	D

Summary

This study provides a basis for examining and comparing the motivation of students when they are taking a Web-based course versus an on-campus course. The unique opportunity of observing and monitoring student's progress will make the data collection effort worthwhile. The design took into consideration that most courses that are on-line consider the student to be an independent learner, which requires self-discipline and focus that a dependent learner may not possess.

The goal of this project was to identify those traits necessary to be a successful online learner and to determine if a Web-based course utilizes certain components to increase success for a variety of learner types? The findings may provide other researchers with component recommendations that can add the needed dimension to the Web-based learning environment adding to the body of knowledge currently being assembled as education moves into the next phase of online delivery methods for convenience, cost-effectiveness, and to reach a larger and more diverse student body.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

In this chapter the methodology is discussed and the process in which the data was collected is defined. As outlined in this section, the compilation of the data collected and meaningful results applied allowed the researcher to see results of some of the changes implemented before the study concluded. The study lasted approximately 20 weeks or almost two complete quarters. As was defined, the core data collected concerned how students were coping with the new online course being offered and what comparisons can they identify when comparing the online format to the on-campus format.

This was an important element of the study because most studies in this area utilize students taking a complete online course. The first batch of students enrolled into the 2+1 program in March 2004, with two classes being offered on-campus and one class being offered online. That one class was selected as TB133 - Strategies for the Technical Professional. In their second quarter of the 2+1 program those same students

were enrolled into the GE127 College Math I course online. Their other two courses are on-campus. This was an important element of the study because most studies in this area utilize students taking a complete online course; what made this study unique was that the researcher had physical access to the students on two days of the week and the students could draw upon immediate experience for excellent feedback.

Interviews were conducted and surveys were given to the 2+1 students concerning the outcome of the online course. Outcomes of the findings included:

- 80% of the students feel that they are not learning as much with the online course as with the on campus courses
- 60% like working at their own pace but miss the instructor's interaction
- 90% of the students would like to see more immediate feedback from the instructor

These are major roadblocks to on line learning and it may have a lot to do with course selection and design of on line learning in general. On the written survey,

the students also had an opportunity to comment about online learning:

- System does not allow for questions
- No people / teacher interaction like in a classroom
- Wrong type of course to be online "Strategies"
- The course has a team based assignment but online is solitary
- Communication is too difficult

The student frustration level seemed to lead to some less than expected results. The school's administration was not excited about the academic results either:

- 65% of the students were failing the course at midterm (week 6) and 45% actually failed and must repeat the course
- 28% of the students dropped the course and stopped logging in
- 22% of the students dropped the entire school due to online course frustrations

Presentation of the Findings

The findings of the study include the results of surveys, oral interviews, grade reports, attendance reports, and attrition results. When the students began failing the course the results were shown to corporate headquarters. After compiling the information headquarters came out with the following data concerning all of the schools in the system as depicted in Table 4:

Table 4. Failure Rates Across United States

Course name: TB133 - Strategies

District U.S. Schools	Grades Below 50%	Grades between 50%-75%	Grades above 80%
Western	750	350	125
Central	643	234	97
Eastern	475	178	86
Northern	365	126	74
Total enrolled: 3476	64% grade of F	25% grade of D or C	10% grade of B or A

The headquarters' analysis was coupled with the student's feedback survey, which included a comments section. The student's comments are important because the students were able to compare the online course with the on campus course when answering the survey questions. The compiled student comments are listed below. Each comment is ranked based on how many times the same comment was repeated by each of 105 students and the number of students responding with that comment:

1. Online does not work for me (76)
2. Hard to understand assignments (72)
3. System does not allow for questions (67)
4. No people interaction like in a classroom (53)
5. Wrong type of course to put online "Strategies" (46)
6. Online is solitary - need interaction (38)
7. I feel I digest information better by communicating with a teacher 'face-to-face' (34)
8. Web-based material is oversimplified (27)
9. Classroom atmosphere missing (22)
10. I would learn more in a classroom environment (19)
11. The web-site is not available when I need it (15)
12. The browser settings are confusing (12)
13. The interface is not very user friendly (8)

The results and conclusions to the students' comments are discussed in Chapter Five of this paper. The researcher also performed interviews with many of the students having trouble with the online course. The students interviewed were candid and honest with their assessments. Most of the students were diligent and trying to overcome any difficulties they have to become a successful online learner.

One student had the following to say:

" ...Being a single mom I was very excited about the potential of taking an online course. Once I started the course however I was quickly disappointed in what I was paying for. The interface was appropriate but the content was so confusing that I ended up skipping the first three assignments thereby getting a grade of 35 in my first two weeks of attendance. It wasn't that I did not want to do the assignments, it was a matter of poor communication from the instructor."

Another student had other frustrations:

" ..If the purpose of the online course is to streamline the course timeframe of completion and to save the student and instructor time then why have my assignments

not been graded. I have submitted all my work and I am still failing..."

The oral interviews seemed to summarize to these factors:

- Assignments are not explained well enough
- Grading policies are not matched to online assignments and seem to be constructed for in classroom formats
- Course expectations are not clearly defined
- Instructors feedback not timely enough
- The system's grading mechanism needs changing so that an automatic zero is not inserted each week if assignment is not completed yet
- Lack of meaningful content to keep student interested
- Need more Frequently Asked Questions (FAQ) posted
- The online courseware must be tested on all browsers and firewalls. Student having trouble accessing the site because:
 - Firewall not permitting access
 - AOL does not work with courseware
 - Security settings must be turned off

Those interview questions were very helpful and were sent to the schools headquarters for immediate resolutions. Student attrition due to the online course was based on the online experience that students perceived they would have. Students want to enjoy the online course but the results were not as expected as illustrated in Table 5.

Table 5. Results of Online Student Satisfaction

	Positive	Negative
Enjoy Online Learning	40%	60%
Getting more from On campus course	80%	20%
Enjoy Strategies online	30%	70%
Enjoy Math I online	60%	40%

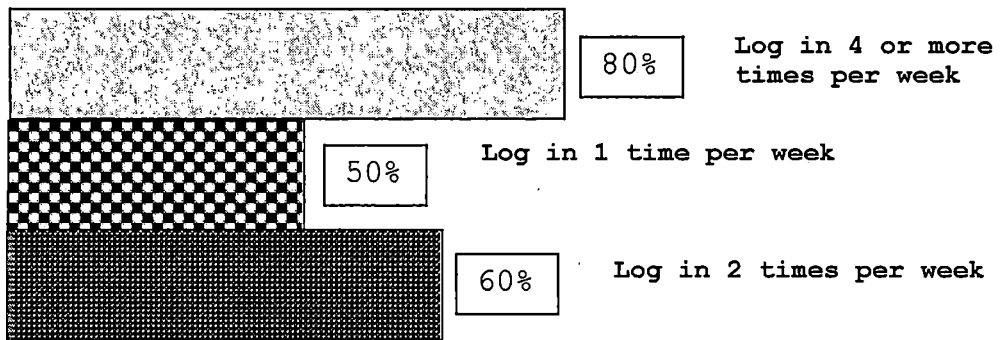


Figure 6. Grade Performance Based on Sessions

Discussion of the Findings

The findings were predicted to show a much better online satisfaction outcome than what was measured. Several key areas were identified that contributed to the results of the study. One area that was relevant is in the online course selection contents. In other words, the course that was selected (Strategies) appears to be a better choice for a classroom setting. Another key area is the instructor interaction with the students. The online instructor must be prepared to deliver the course online and it seems like most are running the course as if it was in a classroom environment.

The data focused on student satisfaction, which would explain the link between poor grades and attrition. The high number of failures resulted from instructor's delivery methods and course content. Based on the data, online courses would appear to need more communication mechanisms than are currently deployed. Many students became frustrated when they could not get a timely response to their questions.

The actual numbers correspond with the students' frustration levels. 10% of the students received a B or an A in the online course with 64% failing across the

country without any geographical normalization applied. The data points out several key areas that can be remedied with proper instructional design modifications. Those areas include:

- Assignments are not explained well enough
- Course expectations are not clearly defined
- Lack of meaningful content to keep students interested

Recommendations are discussed in the next session. Solving these issues must be a top priority for any online course provider.

Some of the system issues are inherent in most online courses. Upon interviewing providers using typical courseware seem to confirm they were likewise plagued with the same technology issues.

These key technology areas need solving:

1. The system's grading mechanism needs changing so that an automatic zero is not inserted each week if assignment is not completed yet
2. Instructors feedback not timely enough

The system needs a grade and students may need to receive partial grades to satisfy the system. In

traditional college courses grades are submitted one time at the end of the quarter or semester. With post-secondary for profit schools grades need to be updated weekly. This is particularly important if the school depends on government assistance, which most schools do and are tracked by government agencies. With an on-campus instructor, grades are controlled and updated weekly on campus. With the online course however it has not been feasible and a grade of zero is used until the assignment can be assessed completely. This diminished the student's ability to see positive results when doing assignments that spread across several weeks.

The instructor's feedback delay is of a prime concern to the school administration concerning further implementation of the online courses. Students' expectations require a turnaround of no more than 48 hours to ask the instructor a question that concerns general information questions. Students would like to hear back within 24 hours when the question is holding up the progress of an assignment. This demand is not possible for an online instructor to handle with technology currently deployed. Recommendations and suggestions are offered in Chapter Five.

Summary

Online courses are in their infancy and some of the technologies needed to correct these areas may not exist yet. However, this cannot stop the progress of implementing online courses in a market driven educational environment. The researcher was involved in the development and implementation of process changes to eliminate many of the issues uncovered in this research. Those improvements are outlined in Chapter Five of this paper.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Based on the research and data collected in this study it has been found that online learning is still at the very beginning stages. The adult learners concept and expectations for an effective online classroom experience has not been met. Timely communications between the online instructor and the online student appear to be the biggest hurdle. The online course developers and the online course implementers have not committed themselves to taking advantage of the communication technologies available for use. An example of this would be to utilize the Internet Telephony technologies to set-up a voice connection during the online instructors office hours. Most students were simply frustrated on trying to understand the assignment. The online instructor using a voice connection could have easily answered many of the questions. It turns out that the language of education and communicating that is most important appears to be the biggest hurdle to overcome.

Neither the computer experience nor the type of computer used seems to influence the grade distributions amongst the online students. Many also felt that the web-based material was oversimplified which led to some boredom when doing the assignments. The Math course online is seeing a more positive outcome. This further provides evidence that online course selection is important. The Math is more of a drill-and-practice format whereas the Strategies course is more of a writing and critical thinking course.

Conclusions

Included in Chapter Four was a presentation of the data received from the Survey and Interviews. From this data, certain conclusions can be drawn. Only 35% of all Online TB133 Strategies students passed the course nationwide. This indicates a core problem with the course itself and ruling out individual student hardware/knowledge issues. More than 70 students out of 105 felt that the online course did not work for them. This indicates these students have given up and will not be candidates for

another online course even though the following quarter will have the GE127 Math I course going online as well.

1. Less than 20 of the online students were having system problems. This included browser settings, slow connection, or availability of an online computer. This is further proof that course content and course management are now the main issues surrounding a successful online course implementation

Fifty-three of the students missed the people interaction of a classroom. These students missed the instructor and fellow students interface.

Recommendations

Based on this study it is recommended that online developers get more involved with the implementation of the online course. This study represented a formative evaluation whereas the results were forwarded to the company headquarters and changes will be incorporated. It is recommended that schools incorporate a test phase before releasing the new online curriculum to all schools throughout the district or country. Schools should develop training programs for online instructors teaching

them how to communicate effectively with online students. Potential online students need to be informed of the current online experience and be offered a choice. This choice should include taking the course online or on campus in a traditional format. To improve grades and reduce online student attrition the on campus option should be available at any time during the quarter. Currently, frustrated online students have no option but to drop the course. Several key recommendations and course components are listed.

1. Run a parallel online student-tutoring lab on campus. This was tried in the second quarter of data collection and a 40% decrease in student failures have been noted.
2. Online course developers need to improve the ability for the instructor and student to communicate. Using email and asynchronous chat sessions do not accomplish the need. Better communication plug-ins and course components must be developed to overcome non-synchronized communication problems.

Summary

Chapter Five reviewed the conclusions extracted from the project. Lastly, the recommendations derived from the project were presented. The data showed that more than half of the students did not pass the online course. The outcome of this study pointed to one area; Student and Instructor Communication must improve to see results. After factoring out the technical difficulties some of the students had (i.e., browser settings, slow connections, etc), the main outcome of these point to a need for better communication between the student and instructor. Also, the results of this study points to a lack of technologies and communication tools being used for real-time communication between instructor and student. The researcher recommends that further studies be conducted to develop and improve the communication tools available to future online course developers. For now, developers are reminded to pay particular attention to this area in an attempt to make the online educational experience as effective as the classroom experience.

APPENDIX

SURVEY

Student/Interviewee # _____

We have asked you to participate because you are at an introductory level at ITT Technical Institutes 2+1 (One course web-based - two courses in classroom) format.

The end result of this questionnaire is to create a better learning environment for future course formats.

(Please circle your answer)

Week 1

1. What type of computer do you have at home?

PC MAC No Computer

2. How long have you used a computer on a daily basis?

1 month 1 year 5 years 10 years

3. Do you use email on a daily basis?

Yes No

4. Have you ever taken a web-based course before?

Yes No

5. Do you think you will be a successful web-based learner?

Yes No

Why? _____

6. Do you use computers to do the following? (Write yes/no)

		Daily	Weekl
--	--	-------	-------

7a.	Chat?		
7b.	Conduct Research for class?		
7c.	Store / Print Photographs?		
7d.	Email Classmates?		
7e.	Email Family members?		
7f.	Shop Online?		

8. Do you feel you have are learning as much in the Web-base course as compared to your classroom class?

Yes

No

Why? _____

9. What issues are you facing when taking the Web-based course? (Select all that apply)

		Problem Area
9a	Basic computer use.	
9b	Internet.	
9c	Email.	
9d	Loading of Software to run	
9e	Communicating with	
9f	Getting feedback.	
9g	Understanding assignment.	
9h	Hard to focus on Web-	
9i	End up surfing instead of	
9j	Answering email instead of	
9k	Miss interaction with	
9l	Other?	

10. What areas do you really like about taking the Web-based course? (Select all that apply)

10a	Convenience.	
10b	More in-depth than classroom course.	
10c	Ability to interact with instructor.	
10d	Easier to concentrate.	
10e	Feel that I am learning more in	
10f	Find the course structure efficient	

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